

THE IMPLICATIONS OF AIDS FOR THE
FUTURE FINANCIAL STABILITY OF
THE MEDICARE PROGRAM

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INTRODUCTION

The Health Care Financing Administration has estimated that in 1988, approximately \$3 billion will be spent in the United States for health care provided to persons with AIDS. Of this estimated amount, one-half percent was expected to be paid by the Medicare program on behalf of the 300 or fewer Medicare-eligible persons with aids -- approximately \$15,000,000, accounting for only .0002 percent of the \$88 billion budget projected for Medicare in that year. The Office of the Actuary has projected costs of AIDS to the Medicare program through 1993, when they estimate that approximately 4.5 percent of AIDS patients will be Medicare eligible. Even in 1993, Medicare costs of AIDS are projected to be only \$400 million (HCFA Office of the Actuary, Communication, April 12, 1989).

At the present time, AIDS is clearly a much greater financing problem for the Medicaid program, and for the private sector, than it is for the Medicare program. However, as the size and composition of the AIDS population changes and as new therapies are developed that prolong life, Medicare may begin to bear a considerably higher proportion of these costs. In addition, political pressures may result in policy changes that extend Medicare coverage to some or all AIDS diagnosed persons. The implications of these changes for the stability of the Medicare Trust Fund and for the Federal budget deficit may be profound, depending upon the number of AIDS patients who are covered under Medicare and the stage of the diseases at which they become Medicare eligible.

The purpose of this paper is to consider the implications of AIDS for the future financial stability of the Medicare program, under current assumptions and under alternative scenarios. In the next section of this paper, the

structure and financing of the Medicare program is described in order to provide a framework for discussion of issues that may affect Medicare program costs related to AIDS. Then, in turn, these relevant issues are raised and discussed:

1. epidemiological issues
2. eligibility
3. services coverage and use
4. financing innovations
5. costs to the Medicare program

The discussion in each section raises each of these issues and their implications for the Medicare program and then goes on to discuss potential changes that may have an impact on Medicare program costs. Finally, a summary discussion of the implications of AIDS for Medicare program costs is presented.

B. STRUCTURE AND FINANCING OF THE MEDICARE PROGRAM

The Medicare program was implemented in 1967 under Title XVIII of the Social Security Act. Most persons aged 65 and older are entitled to participate under Medicare Part A and, while Medicare Part B is voluntary, nearly all eligible beneficiaries participate by paying a monthly premium. Eligibility for Medicare benefits is also available to persons under age 65 who are receiving monthly Social Security benefits on the basis of disability, after a 5 month waiting period. End stage renal disease patients are entitled to Part A benefits regardless of age and both the disabled and ESRD eligibles may elect to participate in Medicare Part B. Table 1 presents the number of Medicare eligibles, by category, for the 1980 through 1987 period.

The Medicare program is intended to provide protection against costs associated with acute medical care episodes and does not include long term care benefit coverage. Table 2 summarizes Medicare Part A and Part B coverage in 1988. The increase in Medicare deductibles and Part B premiums has been

TABLE 1
NUMBER OF AGED AND DISABLED ENROLLEES
UNDER MEDICARE PART A AND PART B
1980, 1985, 1987
(in thousands)

Medicare Category	Year		
	1980	1985	1987
<u>Part A</u>			
Aged	24,572	27,203	28,222
Disabled, Not ESRD	2,898	2,814	2,858
ESRD	61	92	126
<u>Part B</u>			
Aged	24,410	27,110	28,171
Disabled and ESRD	2,703	2,671	2,763

SOURCE: U.S. House of Representatives, Committee on Ways and Means, Background Material and Data on Programs Within the Jurisdiction of the Committee on Ways and Means, 1988 Edition, March 24, 1988.

substantial since the program began. In 1966, beneficiaries paid a hospital deductible of \$40 which has risen to \$540 by 1988. The Part B premium was \$3.00 in 1966 and has risen to \$24.80 in 1988. Despite the protection offered by the Medicare program, beneficiaries in 1985 spent the same proportion of their income on health care as they did in 1965 before Medicare was implemented (Lave, 1986). At the same time, expenditures for the Medicare program have risen at a much faster pace than was envisioned when the program began. Table 3 summarizes growth in Medicare outlays between 1967 and 1987.

It is important to note that overall Medicare has paid, in the past, only 60 percent of the cost of covered services on behalf of beneficiaries, and beneficiaries also are liable for uncovered services. Long term care, prescription drugs, mental health care, and dental services are major categories of services not covered or with very limited coverage under the program. Medicare was not designed to provide comprehensive coverage for chronic diseases. This is relevant for the consideration of the implications of AIDS for the Medicare program since AIDS patients typically live two or more years with acute episodes but with continuing needs for home health or skilled nursing care, mental health and social support services, dental care, and other services. Without considerable expansion of Medicare benefits, only a fraction of expenditures incurred for Medicare-eligible AIDS patients will be paid under the Medicare program.

The expanded coverage offered under the Catastrophic Coverage Act of 1988 (P.L. 100-360), however, could substantially increase the proportion of covered services' costs paid under Medicare on behalf of eligible AIDS patients. Only one hospital deductible annually will be paid by beneficiaries and out-of-pocket costs for covered Part B services will be limited to \$1370 in Fiscal Year 1990.

TABLE 2
MEDICARE PART A AND PART B BENEFITS, PREMIUMS, DEDUCTIBLES
AND COINSURANCE REQUIREMENTS

1988

Medicare Benefit	Coverage	Premium	Deductible	Coinsurance
Part A				
Inpatient hospital	Days 1-60	--	\$540	--
	Days 61-90	--		\$135/day
	Days 91-150*			\$270/day
Skilled nursing facility	Up to 100 days following hospitalization			
	Days 1-20	--	--	--
	Days 21-100	--	--	\$68/day
Home health care	Unlimited but no more than 21 consecutive days	--	--	--
Hospice	210 days	--	--	--
Part B				
Physicians' and other Ambulatory Services	For treatment of illness	\$24.80/mo	\$75	20% of reasonable charges plus excess above reasonable charges

SOURCE: U.S. House of Representatives, Committee on Ways and Means, Background Material and Data on Programs Within the Jurisdiction of the Committee on Ways and Means, 1988 Edition, March 24, 1988.

*After 90 days in one benefit period, beneficiary is only covered by drawing upon a 60 day lifetime reserve. When this reserve is used up, beneficiary has only coverage for up to 90 days in benefit period.

TABLE 3
GROWTH IN MEDICARE OUTLAYS, 1967 TO 1987
(in millions)

Fiscal Year	Part A	Part B	Total
1967	\$2,597	\$799	\$3,396
1970	4,953	2,196	7,149
1975	10,612	4,170	14,782
1980	24,288	10,737	35,025
1985	48,654	22,730	71,384
1987	50,803	30,837	81,640

SOURCE: 1987 Summary of the Annual Report of the Medicare Board of Trustees

In 1991, 50 percent of prescription drug expenses exceeding \$600 annually will be paid by the Medicare program. With AZT¹ therapy being offered increasingly to early or pre-symptomatic persons infected with HIV virus, the drug benefit expansion of Medicare may be particularly significant in estimating the potential financial impact of AIDS for the Medicare program.

Two aspects of the Medicare program are particularly relevant to our examination of the potential financial implications of AIDS:

1. the current estimates of financial stability of the Medicare program, and
2. experience with special disease coverage under Medicare

AIDS may affect the financial stability of the Medicare program, even if only moderate numbers of AIDS patients are covered. This effect may be of greater or lesser concern depending upon the financial stability of the Medicare program, generally. At present, inpatient hospital, SNF, and home health services are funded through the Hospital Insurance Trust Fund which is financed through Social Security payroll tax contributions paid by employers, employees, and the self-employed. The financial stability of the HI Trust fund requires that income from payroll taxes exceed outlays for Medicare benefits and administrative costs. The Congressional Budget Office has estimated that income to the HI Trust Fund will grow at an average annual rate of 8.0 percent between 1989 and 1993, while outlays are expected to increase by 9.8 percent annually.

¹In 1987, the FDA approved Azidothymidine (AZT) for use in HIV treatment. The company marketing the drug, Burroughs-Wellcome, registered it as "Retrovir" in the United States. Burroughs-Wellcome changed the chemical name of the compound to "zidovudine" during its initial worldwide marketing effort. The initials "AZT" remain the most commonly used acronym in the literature and will be used in this paper.

However, it has been estimated that the HI Trust Fund will be solvent through 2003, even under fairly conservative assumptions, (U.S. House of Representatives, March 24, 1985).

The Supplementary Medical Insurance Trust Fund is financed through beneficiary premiums and general tax revenues. In 1986, 3.8 percent of general tax revenues went to support Medicare Part B expenditures. The Medicare Board of Trustees Annual Report (1987) estimates that the General Revenues transfer to the SMI program will be nearly \$33 billion in 1989.

Rapid growth in Part B expenditures has occurred virtually every year since the program was initiated. In 1988, beneficiaries were faced with substantial increases in premiums and CBO has estimated that the share of general revenues required to support Medicare Part B under current assumptions will reach 5 percent by 1991. If AIDS treatment costs becomes a significant share of Medicare program expenditures over the next decade, the effect on beneficiary premiums and on the already substantial Federal budget deficit may have considerable political and economic consequences, despite the fact that some of these real increases may reduce burdens on State Medicaid programs and the Federal Medicaid budget.

It also is useful to examine the Medicare program experience with End Stage Renal Disease in considering the potential implications of AIDS for Medicare's financial stability. In 1972, under P.L. 92-603, Medicare coverage was extended to most persons with chronic renal failure. In 1974, the ESRD program served 15,993 beneficiaries and cost \$229 million; by 1984, 87,000 beneficiaries were enrolled in the program and annual expenditure had risen to \$2.1 billion. The Health Care Financing Administration has estimated the ESRD

expenditures may rise to \$3.5 billion by 1990 (U.S. House of Representatives, March 24, 1988).

The ESRD experience is instructive for a number of reasons. As AIDS becomes a more prevalent disease, some state Medicaid programs and private insurance companies may face severe financial pressures and, in turn, there may be persuasive political pressure to expand Medicare to cover AIDS patients in the same way that ESRD coverage is structured.² This approach would immediately enroll AIDS patients in Medicare upon diagnosis, eliminating the requirement for disability determination and the 29 month waiting period. Clearly, this policy alternative would have profound implications for the financial stability of the Medicare program. The ESRD experience is pointed: In 1974, ESRD expenditures were 2.8 percent of total Medicare expenditures; by 1984, ESRD accounted for 5 percent of total Medicare expenditures. AIDS-related eligibility for Medicare could result in larger numbers of new eligibles than are covered under ESRD program (136,000 in 1988) and in higher costs per beneficiary (\$20,186 per ESRD beneficiary in 1988) (U.S. Congress, March 15, 1989).

C. EPIDEMIOLOGY

AIDS is principally a disease of young to early middle-aged adults. This is the result of the fact that persons in the groups at greatest risk -- sexually active homosexual men, IV drug users, and hemophiliacs and their sexual partners -- tend to be young. The risk group that is most likely to include Medicare beneficiaries is transfusion recipients before the Spring of 1985 when

²Legislation that would create a special AIDS program was introduced in Congress in Fall, 1987 but was not approved.

screening went into effect. CDC reports that in June 1988, only 10 percent of reported AIDS cases were in persons over 49 years of age; a total of 6645 of 64,896 cumulative cases. Andrews et al. (1987) reports that, between 1981 and 1984, the number of AIDS patients over age 55 increased from 0 to 4 and the number of Medicare eligible AIDS patients increased from 5 to 17 in the California Medicaid program. Approximately 4 percent of Medicaid cases in California were Medicare eligible in 1984. AARP (1988) has estimated that, if the age distribution of persons with AIDS is the same for the 1.5 million persons estimated to be infected with HIV as for the symptomatic population" there are almost 150,000 people 50 years and older who are HIV positive. If persons who are HIV positive in 1987 survive ten years at the same rate as their non-infected peers, there will be over 419,000 people over age 50 who are HIV positive in 1997."

Moss and Miles (1987) estimate that, by 1991, there will be approximately 27,000 cases of AIDS in persons over age 50. They also report that the distribution of cases of AIDS among risk groups is substantially different for older patients than for younger patients. While 72 percent of total AIDS cases are in homosexual men, only 51 percent of age 60 to 69 AIDS patients and 21 percent of age 70 and over AIDS patients are homosexual. Similarly, while 2 percent of all AIDS cases are transfusion-related, transfusions were responsible for 31 percent of AIDS cases in 60 to 69-year-olds and for 62 percent of cases in 70 and older persons.

All evidence to date clearly suggests that the risk group that is most likely to include aged Medicare beneficiaries is transfusion recipients, and their sexual partners, who received blood before the Spring of 1985 when mandatory testing of blood supplies was implemented. MMWR (March 20, 1987)

reports that 8 percent of 204 multiple transfused leukemia patients who were tested in New York City were sero-positive for the HIV antibody. MMWR (October 31, 1986) also reports that 92 percent of Hemophilia A patients and 52 percent of Hemophilia B patients are antibody positive. Although leukemia patients and hemophiliacs who receive multiple transfusions and concentrated transfusions are much more at risk than are individuals who receive only a small number of transfusions, it has been estimated that approximately 7,200 blood recipients in 1984 received antibody positive blood and that approximately 12,000 persons acquired a transfusion associated HIV infection between 1978 and 1984 (Peterman et al., cited in MMWR, March 20, 1987). Since Medicare aged beneficiaries accounted for 30 percent of hospital discharges and 41 percent of hospital days in 1984 (NCHS, 1987), a large fraction of persons with transfusion-acquired AIDS will be Medicare eligible due to age.

Although the clinical data are very difficult to obtain, there does appear to be a perception that individuals who are exposed to the HIV virus through blood products may experience a briefer period between exposure and development of symptomatic AIDS than occurs in persons with other sources of exposure (Kaplowitz, 1988). This may result from receipt of more concentrated doses of the virus through blood products than through, for example, sexual transmission. On the other hand, the fact that transfusion recipients tend to be older and sicker than other risk groups may account for an apparent difference in the asymptomatic period observed. If so, then there may be accumulating evidence over time on the relationship between age and the course of the disease.

The introduction of blood screening in 1985 has substantially reduced the risk of transfusion-acquired AIDS. However, a small number of new cases of

transfusion transmission of AIDS is still occurring annually. That risk has been estimated by Ward et al. (1988) to derive from two potential sources: (1) approximately 72 to 90 persons a year will become HIV positive as a result of blood testing that yields false negatives for the HIV antibody. Another 460 persons a year will receive blood that has the HIV virus, but does not have HIV antibodies because the infection is recent. This risk is relatively low, given that 3 to 4 million persons a year receive 18 million blood units through transfusions. However, until direct testing for the presence of the HIV virus (rather than for antibodies, which develop some time after infection occurs) is feasible on a routine basis, some cases of transfusion-acquired AIDS will continue to occur.

Another potential route to Medicare eligibility for the AIDS population is disability. Under current epidemiology scenarios, only a small number of persons with AIDS live sufficiently long after diagnosis to become eligible for Medicare benefits under the Disability Insurance (DI) program. However, recent data based on a survey of AIDS patients in New York City indicate that 15 percent survived at least 5 years. While Black and Hispanic IV drug users survived an average of less than one year, 30 percent of white homosexual men with Kaposi's sarcoma survived 5 years (Rothenberg et al. 1987). Long run survival is not understood to date, because insufficient time has elapsed since AIDS was first diagnosed in the U.S. to permit accurate estimates of survival periods and the course of the disease in those who survive longer periods after diagnosis.

New treatments for AIDS also may increase survival times. AZT was the first of these therapies to prolong life; however, recent evidence suggests that AZT's effect is only short-term and, after a year, most patients were showing

signs of deterioration. These early results may merely reflect the fact that AZT treatment has been targeted on AIDS patients who are fairly far along in the course of the disease. New approaches to therapy that include provision of AZT to asymptomatic patients with HIV infection as soon as their T-cell count begins to drop -- or even before -- may yield different results. At a minimum, the AZT experience does indicate that therapies that prolong life may well be feasible and may result in survival of some AIDS patients to permit them to become Medicare eligible through disability or age.

These therapies, however, may be less effective or feasible for aged patients who have other complicating conditions. AZT and similar therapies are damaging to the body and older people may be less able to tolerate the side effects and aggressive treatment of older persons with AIDS may not be possible or desirable. To date, there is insufficient information on the effectiveness of AZT in slowing the onset of symptoms or relieving symptoms in persons with AIDS, by age group. Consequently, drug therapies such as AZT may be useful to help younger persons survive long enough to qualify for Medicare through the DI program, but may not prolong the life of patients who become HIV positive and symptomatic at older ages.

Finally, current epidemiological estimates suggest that nearly 100 percent of HIV positive individuals will eventually develop AIDS. It may be that AIDS, like syphilis and tuberculosis, has a long course of development in some individuals, emerging as dementia or other manifestations in those who do not develop more acute disease symptoms earlier. If so, two or three decades from now, there may be a large increase in Medicare eligible AIDS patients.

In summary, the epidemiological evidence on the number of potential future AIDS patients who will be Medicare beneficiaries is weak to nonexistent. To make accurate estimates of this population at risk, we need better data on:

- the current distribution of AIDS patients and antibody positive persons by age, by risk category
- the age distribution of new antibody positive cases, by risk category
- duration of antibody positive status before development of AIDS, by age at exposure and by source of transmission
- survival time after development of AIDS, by age at exposure and risk category

In addition, to project the number and characteristics of future Medicare eligible AIDS patients, assumptions must be made about new therapies and their effect on survival time and about late onset manifestations for those antibody positive persons who do not develop AIDS for a decade or more after exposure.

D. ELIGIBILITY

Eligibility for Medicare benefits can occur through three avenues: the Old Age and Survivors Insurance Program, the End Stage Renal Disease Program, or the Disability Insurance Program. Those who qualify under these programs' eligibility requirements are entitled to receive Medicare Part A benefits for inpatient hospital and other institutional services. They also may choose to participate in Medicare Part B which provides physician and other ambulatory services by paying a monthly premium.

To become eligible for Medicare under the OASI program, persons must be 65 years of age or older and be "fully insured" or the spouse of a person "fully insured" for OASI coverage. A beneficiary is fully insured under OASI if they

have one quarter of coverage for every four quarters elapsing after 1950, or the year of reaching age 21, if later, up to the year in which they reach age 62. A person must have at least six quarters of coverage to be fully insured. A person with 40 quarters of coverage is fully insured for life (U.S. House of Representatives, March 20, 1988). Eligibility for the Disability Insurance program requires that the worker be fully insured under OASI requirements and have a total of at least 20 quarters of coverage during the 40 quarter period ending with the quarter in which the worker became disabled.

The definition of disability used to qualify persons for DI eligibility requires that there be an inability to engage in any substantial gainful activity as a result of a physical or mental impairment that is expected to last for at least 12 months or to result in death. An initial 5-month waiting period is required before DI benefits are paid to an eligible beneficiary. If the beneficiary can meet income tests, then he or she is eligible for Supplemental Security Income during the waiting period for DI eligibility. SSI eligibility also includes Medicaid eligibility in most States; however, once DI payments begin the beneficiary's income may be too high to qualify for SSI or Medicaid eligibility. The DI beneficiary must wait 24 months after beginning to receive DI benefits before becoming eligible for Medicare program participation.

Eligibility for the End Stage Renal Disease Program is available to individuals who are medically determined to have End Stage Renal Disease, are fully insured for OASI or are receiving Social Security benefits, or are the spouses or dependents of persons who are receiving social security benefits.

Under the current eligibility rules, Medicare serves approximately 1 percent of persons with AIDS (Roper, 1988). The majority of these beneficiaries are eligible for Medicare under the disability insurance program. Enoff (April

27, 1988) estimates that the DI program was providing income benefits to approximately 8,100 persons with AIDS at year end 1987. This number is less than 1 percent of all DI beneficiaries. He also estimates that DI beneficiaries with AIDS are alive for an average of 10 months after qualifying for initial disability benefits. Few DI beneficiaries with AIDS survive long enough to become Medicare eligible.

Persons with AIDS have been designated as "presumptively disabled" by the SSI program. This presumptive disability status permits them to receive Supplemental Security Income payments and Medicaid benefits while they are waiting the five month period necessary to become entitled to DI. Enoff points out that the rate at which persons with AIDS are ruled eligible for disability benefits is very high. Over 90 percent of disability claims from persons with AIDS are approved, compared with only 35 percent of all disability claims that are filed with the program. Enoff estimates that the number of disability eligible persons with AIDS will increase 4 to 5 times over the next four years.

The current eligibility rules for Medicare make it unlikely that the Medicare program will become a major source of payment for health care for the AIDS population. Unless there are many more HIV infected persons than are currently estimated or there is a major therapeutic breakthrough that prolongs life substantially, permitting many more persons with AIDS to live to normal Medicare eligibility age, Medicare will probably continue to play a minor role in the financing of the AIDS epidemic. One critical caveat to that expectation, however, is policy change that shortens or eliminates the waiting period for DI eligibility. The Presidential Commission on AIDS has recommended that this waiting period be reduced to 12 months, in order to coordinate with the mandated private insurance 18 month extension under COBRA with Medicare eligibility

rules. There has also been legislation (H.R. 276) introduced in Congress during 1987-88 that would eliminate the 24 month waiting period for persons with AIDS, for a five year period. CBO estimates that this legislation would result in an increase in the number of DI eligible Medicare beneficiaries, with approximately 7,050 being eligible in 1987 and 27,050 eligible in 1991. These numbers of DI eligible Medicare beneficiaries with AIDS could increase Medicare costs by up to \$1 billion by 1991.

An alternative legislative proposal, S.24, would extend Medicare eligibility to disabled AIDS patients but also would require all disabled persons with AIDS to elect private insurance coverage and the 18 month COBRA extension, if it were available to them, before they become Medicare eligible. This reliance on the private sector for partial coverage results in an estimate of \$230 million in increased Medicare expenditures in 1988, rising to \$550 million by 1991 (CBO, June 17, 1987).

The Health Care Financing Administration's Office of the Actuary also has analyzed the increased costs associated with waiving the 24 month DI waiting period for Medicare for DI eligible persons with AIDS. Donkar (1988) estimates that under this scenario, by 1991, 23,300 additional AIDS patients would be Medicare eligible and these beneficiaries would add about \$135 million to Medicare expenditures in that year.

E. SERVICE COVERAGE AND USE

Medicare is primarily an acute illness insurance program. Long term care services, mental health services, and prescription drugs are examples of services that tend to be used heavily by AIDS patients to the extent available, but which have limited coverage under the Medicare program. Even for approved

charges for covered services, Medicare pays only 80 percent of the total cost to Medicare beneficiaries, due to deductibles, coinsurance, and caps on Medicare allowable charges. Beneficiaries also are liable for balance billing by physicians and other providers who do not accept Medicare assignment.

While there have been numerous studies in the past several years of the service utilization by persons with AIDS (e.g. Belmont, 1985; Scitovsky, Cline, and Lee, 1986; Seage, 1986; Hardy, 1986; Andrulis, et al., 1987), many of these studies have been limited by focusing on specific geographic areas, risk groups, and principal manifestations. As Bilheimer (1988) has noted, these studies have significant limitations for projecting service use patterns into the future, since:

- most studies are not diagnosis or risk group specific
- AIDS service utilization patterns are changing rapidly, with declines in average lengths of stay being reported from several regions of the country
- definitional and measurement differences make it difficult to compare the results of different studies.

Despite these limitations, some estimates of service use provide at least a starting point for assessing service requirements for persons with AIDS. Scitovsky et al. (1986) have estimated that the average AIDS patient will use between 22 and 63 hospital inpatient days annually. The San Francisco Department of Health assumes an average of 26.2 inpatient days annually per AIDS patient, while Andrews et al. (1987) report an average of 16 inpatient days annually for Medi-Cal eligible AIDS patients in 1984. Scitovsky's work also indicates that there is great variation in inpatient hospital use, depending upon principal manifestation and stage of the disease. For example, patients

diagnosed with Kaposi's sarcoma have very low inpatient hospital use early in the course of their disease; however, as they reach the later stages of the disease and develop additional manifestations, these KS-diagnosed patients tend to use inpatient services as intensively as do AIDS patients with more severe manifestations. Northern California data on service utilization, however, are not necessarily generalizable, since San Francisco has developed a well-organized response to the disease, and the distribution of AIDS patients by risk group and principal disease manifestation is quite different in other areas of the country.

If data are very limited on inpatient service use, information on use of other services is nearly nonexistent in any form that might be useful for even crude generalizations. Scitovsky's estimates of 28.8 outpatient physician visits for AIDS patients alive all year can be compared to Andrews et al. (1987) estimate of 23 ambulatory visits by Medi-Cal eligible AIDS patient. Minnesota, on the other hand, has estimated that, in the Twin Cities, AIDS patients will use 13.6 outpatient physician visits per patient year -- a fairly low estimate compared to the Northern California data (Bilheimer, 1988).

At present, there is not sufficient data to permit reliable estimates of services utilization to be made for AIDS patients. There is even less information available for estimating service utilization needs for the Medicare eligible AIDS population. Those who are Medicare eligible by virtue of age are distributed very differently across the AIDS risk groups than are all AIDS patients and, consequently, as a group might be expected to have very different service use patterns than all AIDS patients. In addition, because Medicare eligible AIDS patients are older, they may be expected to react differently to the disease and to various therapeutic regimes and these differences may be

reflected in service utilization patterns. Thus, estimates of the service use of these individuals cannot be made with any reliability.

With respect to Medicare eligible AIDS patients' service use, it is also necessary to consider the implications of the Medicare Catastrophic Coverage Act of 1988. In addition to the cost aspects of this legislation (discussed below under Financing Innovations), the elimination of cost-sharing requirements for hospital care, once an initial deductible for the first hospital stay each year has been met, and the elimination of the limits on number of days per year covered may result in an increase in the use of hospital services for AIDS patients covered by Medicare. This is particularly relevant because of the fact that long term care benefits under Medicare remain limited (although expanded under the Catastrophic Coverage Act). Similarly, the copayment cap on Medicare Part B services costs -- set at \$1370 out-of-pocket in 1990 -- may induce additional utilization of these services by AIDS patients who have reached the cap and face no further out-of-pocket liability. No publicly available estimates of the induced demand effects of the new catastrophic provisions of the Medicare program were identified in our background literature search. However, there is a substantial body of research on the relationship between coinsurance levels and demand for medical services that strongly suggests that the quantity of health services demanded by Medicare beneficiaries will increase when the catastrophic provisions go into effect.

Skilled nursing facility, home health care, and hospice benefits are also expanded under the new catastrophic provisions of Medicare. Skilled nursing facility services were limited to no more than 100 days per spell of illness, following a minimum 3 day hospital episode; the new provisions expand SNF coverage to 150 days per year and eliminate the 3 days of hospitalization

requirement. Home health care was limited to 21 consecutive days; the new rules will permit 38 consecutive days of home health care. Hospice benefits were available under Medicare for a lifetime limit of 210 days; this limit is eliminated under the Catastrophic Coverage Act.

Another change under the Catastrophic Coverage Act that may influence service use by Medicare eligible AIDS patients is the prescription drug benefit. This new benefit will be phased in between 1990 and 1993. Beginning in 1990, coverage will be provided for drugs administered intravenously at home and for immunosuppressive drugs after the first year following a transplant, subject to a deductible amount of \$550, with a coinsurance of 20 percent on intravenous drugs and 50 percent on immunosuppressive drugs. The full drug benefit program will cover all outpatient prescription drugs and insulin, subject to a deductible of \$600 in 1991. Coinsurance will be 50 percent in 1991, 40 percent in 1992, and 20 percent in 1993 and subsequent years.

While the expansion of all benefits under the Medicare program has the potential to affect the mix of services used by Medicare eligible AIDS patients, the prescription drug benefit has a substantial probability of increasing the use of drugs to slow the course of AIDS. Although there are currently only a very few drugs that have been approved as treatment for AIDS, a significant research effort is underway to develop alternatives that may slow the course of the disease in HIV positive or AIDS patients. AZT, the first of the drugs approved to treat AIDS patients, was initially restricted to use by patients in the later stages of the disease and was of limited effectiveness in delaying the onset of symptoms of greater severity. However, as the medical establishment is learning more about the disease, there is a likelihood that AZT and other subsequently developed drugs will be used at earlier stages to prevent the

development of AIDS in HIV positive individuals or to slow the development of severe manifestations in patients who are in the early stages of the disease. AZT annual costs have been estimated as \$9,600 per patient; insurance coverage for half of the costs over \$600 annually may well influence physicians to prescribe drugs to AIDS patients more freely -- even when the expected benefit is fairly small -- when the patient does not have to pay all of these costs out-of-pocket.

To summarize, there is little firm evidence on the service use of AIDS patients and there is no evidence on how service use by Medicare beneficiaries with AIDS may differ from use by other AIDS patients. Since it is known that aged Medicare beneficiaries with AIDS are distributed differently than all AIDS patients by risk category and presenting diagnosis (i.e., primary manifestation), there is reason to believe that their use of services may also differ. In addition, the fact that older persons often have other chronic conditions that may affect the course of AIDS in the patient, and which may dictate treatment approaches, suggests that service mix will almost certainly be different in this population. There is no evidence, also, on the characteristics of those disabled beneficiaries that survive long enough to become eligible for Medicare under the Disability Income program.

It is particularly important to examine the mix of services used by Medicare eligible AIDS beneficiaries because of the structure of the financing of Medicare. Institutional services (i.e., hospital inpatient, SNF, home health care, and hospice) are paid for out of the Medicare Hospital Insurance Trust Fund. If Medicare beneficiaries with AIDS use more hospital services because they aren't eligible for Medicaid and long term care services are not fully covered under Medicare, then this could impact on the Hospital Insurance Fund,

which currently is estimated to be financially sound through the early 2000's. On the other hand, if changes in benefits and coverage result in dramatic increases in AIDS patients' use of Part B services (e.g. reduced coinsurance on physicians visits, prescription drug coverage), the increased costs to the Medicare program could result in increased premium costs to Medicare beneficiaries and increased pressure on the Federal budget as general revenues are drawn to pay for 75 percent of the cost of Part B services. Thus, it is important to consider the implications of changing service mix and volume in policy deliberations on management of the AIDS epidemic that focus on Medicare's role.

To fully address the issues associated with service coverage and service use by Medicare eligible AIDS patients, there are a number of questions for which data must be found or assumptions developed. These include:

- How does service mix and service intensity differ for Medicare eligible AIDS patients compared to all AIDS patients? For aged versus DI eligible Medicare beneficiaries?
- Does the acute care emphasis of the insurance coverage provided by the Medicare program affect the mix of services used -- particularly for those Medicare beneficiaries who are not Medicaid eligible and, thus, have limited long term care benefits available?
- To what extent are nursing home services available to persons with AIDS and how do supply constraints affect overall patterns of services use?
- To what extent will the mix of services be influenced by the increased depth of insurance coverage available under the Catastrophic Coverage Act of 1988? The volume of services?
- What effect will prescription drug coverage under the Catastrophic Coverage Act of 1988 have on the prescribing behavior of physicians treating Medicare eligible AIDS patients?

It is unlikely that data will be available at the level of detail that would be desirable to make good projections of the service use and mix of Medicare eligible AIDS patients in the near future. In part, this is due to the difficulty encountered in documenting service use for AIDS patients in general, but it also reflects the fact that the number of Medicare eligible AIDS patients has been very small to date. As these numbers grow and more systematic efforts are made to improve data collection, it is likely that better estimates will become possible.

F. FINANCING AND REIMBURSEMENT POLICY INNOVATIONS UNDER MEDICARE

The Medicare program has relied upon coinsurance and deductibles imposed upon beneficiaries to constrain volume of services purchased. Providers have traditionally been paid costs or reasonable charges and have faced minimal incentives or controls that would influence them to use services in the most efficient way on behalf of their patients. Rapid increases in expenditures under the Medicare program, however, have led in recent years to significant changes in the way that providers are reimbursed under Medicare.

Beginning in 1983, hospitals have been paid under the Medicare program through a prospective payment system where hospitals receive a flat amount per hospital admission and the level of payment is related to the diagnosis for which the patient is admitted.³ The incentives provided by the prospective payment system are profoundly different from the incentives that hospitals faced under the prior cost-reimbursement system. Hospitals make money by providing

³The Health Care Financing Administration implemented a prospective payment system (PPS) for hospitals. The payment per admission is based upon average costs calculated for Diagnosis-Related-Groups (DRGs) from internal HCFA data.

services most efficiently and by minimizing the length of stay of patients admitted under the prospective payment system. Between 1983 and 1986, hospital days per 1000 Medicare beneficiaries fell nearly 25 percent, and a substantial proportion of the decrease has been attributed to the incentives provided by the new payment system.

At present, since there are few Medicare eligible AIDS patients, no DRG-based payment has been developed under the Medicare program. Consequently, when AIDS patients enter hospitals under Medicare the hospital will be paid according to the diagnosis of admission (e.g. Kaposi's sarcoma, PCP). However, the complexity of treating AIDS patients and the multiple conditions that they often present, as well as the need to maintain special infectious disease precautions, make AIDS patients likely to be much more expensive than non-AIDS patients within the same DRG. If they are sufficiently more expensive, then they may be reimbursable to the hospital under a higher rate as an outlier for the DRG. Development of an AIDS-specific DRG (or a series of AIDS DRGs, related to specific manifestation and to the stage of the patient's disease) may be very difficult until more Medicare eligible AIDS patients exist and sufficient data can be generated to prepare reliable cost estimates.

AIDS patients may also present a particularly serious problem to hospitals under DRG incentives because discharge planning may be unusually difficult. They may require long term care arrangements in order to be safely discharged from the hospital; however, there are very limited long term care alternatives available to AIDS patients in many parts of the country. If the hospital is unable to arrange adequate post-hospital care, then the patient cannot be safely discharged and will remain in the hospital.

Another recent financing innovation under the Medicare program has been the expansion of the program to permit Medicare beneficiaries to choose to obtain care from Health Maintenance Organizations. HMOs offer comprehensive health care services, within a managed care framework, in return for a capitation payment made by HCFA on behalf of Medicare beneficiaries who have chosen to join the HMO. HMOs face incentives similar to those facing hospitals under the Medicare prospective payment system -- since they receive a fixed payment for each Medicare beneficiary who enrolls, they attempt to provide services in a cost efficient manner. Several approaches are used by HMOs to control the costs of the services provided to beneficiaries: 1) they contract with efficient providers, who agree to abide by the HMO's utilization control rules; 2) they negotiate discounts with physicians, hospitals, and other providers; 3) they manage care through a set of utilization control and review mechanisms (e.g. prior authorization for inpatient hospital use); and 4) they spread the financial risk of excessive utilization of services to providers, by capitating physicians for ambulatory services, for example, and by offering financial rewards to providers when surpluses occur in the HMO.

Under the Medicare HMO program, the capitation payment varies by the age, sex, Medicaid status, disability status, and institutional status of the Medicare beneficiary who enrolls in the HMO. However, there has been considerable debate about the appropriateness of the payment methodology and a current effort is underway to develop a payment adjustment to the capitation rate that would take into account the health status of the enrollee. If AIDS patients were to enroll in Medicare HMOs, it would be likely that a specific payment rate, related to the AIDS diagnosis, might be developed.

The HMO approach to managed care might be particularly suitable for the complex and multifaceted health care needs of AIDS patients, since HMOs have incentives to ensure that comprehensive services be available to permit the patient to receive services in the lowest cost appropriate setting. However, it is instructive to observe that the only Medicare beneficiaries who are not eligible to join a Medicare HMO are those who are in the End Stage Renal Disease program and who are expected to incur very high costs on a continuing basis. While HMOs might be a valuable source of information on case management for AIDS patients, the difficulties in developing an appropriate payment rate and HMOs' focus on preventive and ambulatory care might lead few HMOs and AIDS patients to participate in these arrangements.

The passage of the Catastrophic Coverage Act of 1988 also has significant implications for the financing of the Medicare program, as well as for the quantity and mix of services as described above. Beneficiaries' out-of-pocket costs create barriers to obtaining all the services that might be desired if all care were free. Prior to the implementation of the Catastrophic Coverage Act, Medicare beneficiaries paid 25.3 percent of the costs of hospital inpatient services and 42.2 percent of the total costs of physicians' services; in total, Medicare beneficiaries out-of-pocket liability for Medicare covered services was approximately \$561 in 1987. Beginning in 1990, the maximum out-of-pocket liability of Medicare beneficiaries for Medicare covered services will be limited. If Medicare beneficiaries incur health care expenditures related to treatment for AIDS that are approximately the same as the average cost for all AIDS patients, then the Medicare program will incur substantially higher costs on behalf of Medicare eligible AIDS patients. In addition, the new prescription

drug benefit also will have a significant effect on Medicare costs per AIDS patient.

It seems likely that the Medicare program will increasingly rely upon financial incentives to providers and on other utilization control measures to offset the effect of the reduction in barriers to financial access to care that more extensive deductibles and coinsurance provided. This shift, however, may merely reflect the recognition that over 70 percent of all Medicare beneficiaries purchase Medicare supplemental insurance policies which pay deductibles and copayments under Medicare. Fewer than 20 percent of Medicare beneficiaries are actually subject to the full impact of cost-sharing, since there are also a significant number of Medicare-Medicaid dual eligibles. However, shifting the responsibility for controlling service use and expenditures for high cost and/or chronically ill patients to providers through the use of financial incentives may pose some risk to the patient of diminished quality of care. The challenge to Medicare policy makers and program managers is how to balance these financial incentives against the needs of AIDS patients.

G. ESTIMATING THE COSTS OF AIDS TO THE MEDICARE PROGRAM

1. Overview of the Cost Model

A detailed cost estimation methodology was developed, as one component of the work being conducted under this grant, in order to permit baseline estimates of the costs of AIDS to the Medicare and Medicaid programs to be prepared. This methodology has the capability to examine the cost implications of alternative assumptions and policies with respect to the baseline estimates. This means that we are able to change key assumptions in the model and then recalculate costs to the Medicare program and determine the percentage increase

in costs to the Medicare program that are associated with the specific change under consideration. A full discussion of the cost estimation methodology is contained in Bilheimer (1988). In the initial version of the cost model, data from California are used to generate cost estimates; the model has the capability to be expanded to 50 States but data are not available from most other states at this time. The key elements of the model include:

1. the expected number of AIDS cases in 1986 through 1991 in California are obtained from the Centers for Disease Control projections
2. these cases are distributed across four risk groups and two primary manifestations on the basis of California data on risk group and primary manifestation distributions
 - risk groups: Gay/Bisexual, IV Drug Users, Gay/IV, and Other Adults
 - primary manifestations: Kaposi's Sarcoma, PCP
3. the cumulative probability of survival for each risk group/primary manifestation group for years 1 through 6 are estimated using CDC and California data on survival and, for each year, risk group, and primary manifestation, the number of cases are distributed across the categories:
 - diagnosed in year i and alive all year
 - diagnosed in year i and dying in year i
 - diagnosed previously and alive all of year i
 - diagnosed previously and dying in year i
4. the risk groups/ primary manifestation/ survival categories are distributed across 4 major payor groups, based on national and California data on source of payment for AIDS care
 - Medicaid
 - Medicare
 - private insurance
 - other source
5. services used are estimated for each risk group, primary manifestation, survival category, and payor category, by year, based on average service utilization data from California
 - inpatient hospital days
 - inpatient physician visits
 - outpatient physician visits

6. average unit costs are assigned to service use, by payor category, based on national and California data on costs of care
7. total costs for inpatient hospital, inpatient physician visits, and outpatient physician visits are then calculated for Medicare eligible AIDS patients in California, by risk group, primary manifestation, survival category, by year
8. Medicare's share of costs is estimated based on national data on out of pocket liability of Medicare beneficiaries for hospital and physician services.

There are a number of limitations that should be recognized in considering the estimates produced by the cost model. First, the prevalence, service use, and payor distributing assumptions are based upon California data. Although California has a substantial number of AIDS patients, a number of elements of the California AIDS experience is not generalizable to the U.S. AIDS experience, overall. The service use data also reflect the patterns of use of the average AIDS patient in California who is unlikely to be Medicare eligible. There is reason to expect that Medicare eligible AIDS patients may use services in different quantities or mixes than other patients, either because they are older and have complicating conditions or simply because the coverage of acute care service is better than long term care services under Medicare.

Second, the assumptions we have made about costs per unit are strictly arbitrary. Although some data are available of average unit costs for AIDS patients, these data are estimates and based on weak assumptions. In addition, no information is available on average unit costs for Medicare eligible AIDS patients' service use; and there is reasonable grounds to believe that sites of care and provider characteristics may differ for patients covered by different payers.

Medicare covers services other than hospital and physician care, although these two components account for approximately 93 percent of the total Medicare expenditures. It is possible that Medicare-eligible AIDS patients use a different mix of SNF, HHA, DME, and hospital outpatient services than the average Medicare beneficiary -- however, because of data limitations we have only estimated the costs associated with Medicare beneficiaries use of hospital and physician services. In addition, we have assumed the Medicare share of Medicare covered services is the same as the national average (i.e., Medicare pays approximately 75 percent of hospital costs and 58 percent of physician costs incurred by beneficiaries. Beneficiary liability includes deductibles, coinsurance, and unassigned balance bills. While these assumptions are drawn from Medicare experience, it is likely that Medicare eligible AIDS patients may differ from the average Medicare beneficiary in their proportionate share of incurred costs.

Finally, it is important to keep in mind that, in the aggregate, Medicare only pays about 48 percent of total health costs of the Medicare population. Consequently, the baseline estimates of total average costs of hospital and physician provided health care, even when increased to reflect expenditures for all Medicare covered services, still only represents about one half of the annual costs of all health care used by Medicare eligible AIDS patients.

2. Baseline Estimates of Medicare Costs in 1991

The key assumptions about use and costs of services by Medicare eligible persons with AIDS in California in 1991 are presented in Table 4. Our baseline calculations for 1991 indicate that the Medicare program will pay approximately \$10,470,000 on behalf of 843 Medicare eligible AIDS patients, with 85 percent of that amount going to hospital inpatient services and 15 percent as payments

TABLE 4
SUMMARY OF BASELINE MODEL AND ASSUMPTIONS FOR ESTIMATES
OF COSTS OF AIDS TO MEDICARE, 1991

1. Total Number of AIDS cases in California, 1991.....	24,200		
2. Number of Medicare eligible AIDS cases in California, 1991.....	843		
3. Distribution of Medicare cases by risk group:	Gay/bisexual 93%		
	IV Drug Users 0%		
	Gay/IV Users 0%		
	Other Adult 7%		
4. Distribution of Medicare cases by survived category:	Diagnosed/alive all year 38%		
	Diagnosed/dying in year 15		
	Previously diagnosed, alive all year 21		
	Previously diagnosed, dying in year 26		
5. Annual service use estimates:	Inpatient hospital 14,959 days		
	Inpatient physician 17,481 visits		
	Outpatient physician 17,734 visits		
6. Cost assumptions:	Average cost per Medicare hospital day....\$800		
	Average cost per M.D. hospital visit..... 50		
	Average cost per M.D. office visit..... 100		
	<u>Percent Beneficiary Liability</u>		
	Hospital.....25.3%		
	Physician.....42.2		
7. Baseline aggregate costs for Medicare eligible AIDS Cases, 1991	<u>Total</u>	<u>Medicare</u>	<u>Beneficiary</u>
	Inpatient hospital \$11,967,200	8,939,498	3,027,702
	Inpatient physician 874,050	505,201	368,849
	Outpatient physician 1,773,400	1,025,025	748,375
	TOTAL \$14,614,650	10,469,724	4,144,926
8. Average cost per beneficiary:	Inpatient hospital \$14,196		
	Inpatient physician \$ 1,037		
	Outpatient physician \$ 2,104		
	Total average cost per beneficiary \$17,337		
	Average Medicare cost per beneficiary \$12,420		
	Average beneficiary out-of-pocket costs \$ 4,917		

for physicians services'. This yields an average annual cost per Medicare eligible AIDS patient to the Medicare program of \$12,420 for hospital and physician services. Since hospital and physician services for covered services account for 93 percent of Medicare expenditures nationally, this implies that Medicare would pay approximately \$13,355 per person for all Medicare covered services, if it is assumed that AIDS patients used the average number of nonhospital and nonphysician services as is observed nationally.⁴ Assuming that Medicare pays only 48 percent of the total costs incurred by AIDS patients for all health care services, this implies average annual costs of \$27,800 per Medicare eligible AIDS patient in California, in 1991. This admittedly rough estimate falls within the range of total annual costs estimated by other researchers (Bilheimer, 1988). However, the intent of the cost estimation methodology is not to produce absolute dollar estimates but, instead, to generate a baseline annual cost that then can serve as the comparison base for calculating the relative effect on Medicare costs of the alternative scenarios that are addressed in the remainder of this paper. The approach to the alternative scenarios is to report the percent change in Medicare and beneficiary liability rather than the change in dollar amounts.

3. Alternative Scenarios

The data in Table 4 indicate that the average cost to Medicare for hospital and physician services per eligible AIDS beneficiary in California in 1991 will be \$12,420. This provides a baseline estimate of costs that may be

⁴This is probably not a reasonable assumption; however, data are not available to permit a more appropriate assumption to be made. Since it seems likely that AIDS patients may use more of these other services than other Medicare beneficiaries, on average, the total estimate of Medicare costs per beneficiary should be considered a low baseline estimate.

used to examine the relative impact of alternative assumptions and policy options on costs to the Medicare program.

In this section, several alternative scenarios are specified and the cost model is used to estimate the change in costs to the Medicare program that would occur if the alternative assumptions that underlie the scenario were valid. The alternative scenarios to be examined include:

Scenario 1: Assume that AIDS cases are distributed proportionally across all age groups.

Scenario 2: Assume that the waiting period for Medicare eligibility under the Disability Income program is reduced from 24 months to 12 months.

Scenario 3: Assume that the median survival time increases by 12 months.

Scenario 4: Assume the out-of-pocket liability cap provided by the Catastrophic Coverage Act of 1988 is in place.

Scenario 5: Assume that the prescription drug benefit provided by the Catastrophic Coverage Act of 1988 is in place.

Each of these scenarios is discussed in this section and the results of the cost model estimation of the alternative assumptions for these scenarios are presented.

Scenario 1: AIDS Cases Proportional to Population Distribution.

Although Medicare beneficiaries are 12 percent of the population, they account for only approximately 3 percent of all AIDS patients. In addition, those Medicare beneficiaries who have AIDS are less likely to be gay/bisexual or to be IV drug users than the AIDS population as a whole, and are much more likely to have become infected through the transfusion mechanism. However, as AIDS spreads through the population and as new treatments affect the course of the

disease, permitting patients to live longer, it is possible that AIDS will become more evenly distributed through the population and, consequently, Medicare will bear a more proportional share of the financial burden. In Table 5, the implications of the proportional distribution of AIDS cases, by risk category and manifestation, across all age groups, are presented. The number of Medicare eligible AIDS patients in California would increase from 843 to 2,904 in 1991 if AIDS cases were distributed evenly across the population. Since average costs per case would remain the same under this scenario, there is no increase in Medicare expenditures per beneficiary; however, total annual Medicare expenditures on behalf of all Medicare eligible AIDS patients in California would increase by 245 percent in 1991 -- from \$10,470,000 to \$36,120,000.

Alternative Scenario 2: Decrease in Waiting Time for Disability-Related Medicare Eligibility. Under the current rules, disabled persons may qualify for the Disability Insurance program five months after becoming disabled. However, an additional 24 month waiting period is required before DI beneficiaries become eligible for Medicare benefits. This waiting period is particularly problematic under the provisions of the COBRA legislation that mandated an 18 month extension of group health insurance benefits to employees who leave their jobs due to disability, if the employee is willing to pay the group premium rate (plus an allowed additional administrative cost). Thus, a disabled person who loses his/her job may qualify for DI after five months and may maintain their private health insurance coverage at a group rate for an additional 13 months after qualifying for DI. However, at the end of that 13 month period, the DI beneficiary loses group insurance coverage, may not be able to obtain private individual insurance coverage at a price that can be

TABLE 5

ALTERNATIVE SCENARIO 1:
AIDS CASES DISTRIBUTED PROPORTIONATELY BY AGE

	Baseline	Alternative Scenario		Medicare Share	
		Number	Percent Change	Baseline	Percent Change
1. Number of Medicare Eligible AIDS Cases in California, 1991	843	2,904	245		
2. Annual Service Use Estimates					
Inpatient hospital (days)	14,959	51,609	245		
Inpatient physician (visits)	17,481	60,309	245		
Outpatient physician (visits)	17,734	61,182	245		
3. Aggregate Costs for Medicare- Eligible AIDS Cases					
Inpatient hospital	\$11,967,200	\$91,287,200	245	\$8,939,498	245
Inpatient physician	874,050	3,015,450	245	505,201	245
Outpatient physician	1,773,400	6,118,200	245	1,025,025	245
Total	14,614,650	50,420,850	245	10,469,724	245
4. Average Cost Per Beneficiary					
Inpatient hospital	\$14,196	\$14,196	0		
Inpatient physician	1,037	1,037	0		
Outpatient physician	2,104	2,104	0		
Total average cost	17,337	17,337	0		
Medicare cost	12,420	12,420	0		
Beneficiary Liability	4,917	4,917	0		

afforded, and will not be eligible for Medicare coverage for an additional 11 months. The President's Commission on AIDS recommended that the waiting time for disability-based Medicare eligibility be reduced from 24 months to 12 months in order to coordinate with COBRA rules for extension of group insurance availability to 18 months. In this alternative scenario, the impact of this change in policy on Medicare program costs in California in 1991 is estimated. As can be seen in Table 6, the effect is a relatively substantial one. Medicare program costs would increase by 158 percent as a result of reducing the waiting period by 12 months and the average Medicare cost per beneficiary would increase by 32 percent.

These results may be compared with the estimates of CBO (June 9, 1987) of the increased costs that would be associated with legislation proposed to eliminate the two year waiting period. CBO estimated that, in 1991, this legislation would increase Medicare costs by 466 percent. Since approximately half of AIDS patients die within one year of diagnosis, it is reasonable that eliminating 12 months of the 24 month waiting period would result in a substantially smaller impact on annual Medicare costs. In addition, the assumptions underlying this estimate are conservative ones -- including an assumption that DI eligible Medicare beneficiaries use services in the same proportions as non-DI eligible AIDS patients. Consequently, this estimate of the effect of reducing the Medicare eligibility waiting time to 12 months after DI eligibility should be considered conservative.

Alternative Scenario 3: Increase by 12 months in Median Survival Time. The baseline estimates assumed that median survival time for persons diagnosed with KS is 16 months and that the median survival time for AIDS

TABLE 6

ALTERNATIVE SCENARIO 2:
REDUCTION IN DI WAITING PERIOD FOR MEDICARE ELIGIBILITY TO 12 MONTHS
LOW ESTIMATE ASSUMPTIONS

	Baseline	Alternative Scenario		Medicare Share	
		Number	Percent Change	Baseline	Percent Change
1. Number of Medicare Eligible AIDS Cases in California, 1991	843	1,615	92		
2. Annual Service Use Estimates					
Inpatient hospital (days)	14,959	39,641	165		
Inpatient physician (visits)	17,481	45,625	161		
Outpatient physician (visits)	17,734	35,291	99		
3. Aggregate Costs for Medicare- Eligible AIDS Cases					
Inpatient hospital	\$11,967,200	\$31,712,800	165	\$8,939,498	165
Inpatient physician	874,050	2,281,250	161	505,201	161
Outpatient physician	1,773,400	3,529,100	99	1,025,025	99
Total	14,614,650	37,523,150	157	10,469,724	158
4. Average Cost Per Beneficiary					
Inpatient hospital	\$14,196	\$19,636	38		
Inpatient physician	1,037	1,413	36		
Outpatient physician	2,104	2,185	4		
Total average cost	17,337	23,234	34		
Medicare cost	12,420	16,748	35		
Beneficiary Liability	4,917	6,486	32		

patients with other opportunistic infections is 9 months. These assumptions were drawn from Baschetti (1988) who followed a 1984 cohort of persons with AIDS, in California, through 1985. As new treatment alternatives develop, however, it is realistic to expect that survival time will lengthen. This increase in survival time will have implications for the total costs of health care for AIDS patients due to the greater number of AIDS patients who will be alive at any one point in time. In addition, longer survival times will enable a greater number of persons with AIDS to become eligible for Medicare under the DI program. To estimate the impact of the extension of survival times, it was assumed that the median survival time of all AIDS patients in all risk groups and manifestation categories increased by 12 months. The implications of this change in survival times for costs to the Medicare program are shown in Table 7. Total costs to the Medicare program increase by 24 percent. However, the model assumes that average annual costs per beneficiary decline slightly when survival time increases; there are more Medicare-eligible AIDS patients, but they are using somewhat fewer services per capita--perhaps because they are, on average, less sick. The principal effect on Medicare costs comes from the effect that longer survival has on the number of DI beneficiaries who become eligible for Medicare. This increase amounts to 26 percent in California in 1991--from 843 to 1,068 individual Medicare beneficiaries. This increase is reflected in the 24 percent increase in total and Medicare annual aggregate costs.

TABLE 7

ALTERNATIVE SCENARIO 3:
INCREASE OF 12 MONTHS IN MEDIAN SURVIVAL TIME

	Baseline	Alternative Scenario		Medicare Share	
		Number	Percent Change	Baseline	Percent Change
1. Number of Medicare Eligible AIDS Cases in California, 1991	843	1,068			
2. Annual Service Use Estimates					
Inpatient hospital (days)	14,959	18,549	24		
Inpatient physician (visits)	17,481	21,851	25		
Outpatient physician (visits)	17,734	21,813	23		
3. Aggregate Costs for Medicare- Eligible AIDS Cases					
Inpatient hospital	\$11,967,200	\$41,839,200	24	\$8,939,498	24
Inpatient physician	874,050	1,092,550	25	505,201	25
Outpatient physician	1,773,400	2,181,300	23	1,025,025	23
Total	14,614,650	18,113,050	24	10,469,724	24
4. Average Cost Per Beneficiary					
Inpatient hospital	\$14,196	\$13,894	-2.1		
Inpatient physician	1,037	1,023	-1.3		
Outpatient physician	2,104	2,042	-3.0		
Total average cost	17,337	16,959	-2.2		
Medicare cost	12,420	12,150	-2.2		
Beneficiary Liability	4,917	4,809	-2.2		

Alternative Scenario 4: Cap on Out-of-Pocket Liability under the Medicare Program. The Catastrophic Coverage Act of 1988 limits out-of-pocket liability of Medicare beneficiaries in two ways:

1. Only 1 hospital deductible annually is imposed, regardless of the number of hospital admissions or days used in the year. In addition, the limit on number of covered days annually or lifetime is eliminated. Thus, a Medicare beneficiary could be hospitalized for 365 days during one calendar year and the maximum out-of-pocket liability that would be incurred for covered inpatient services would be \$540 (assuming the 1988 deductible).
2. Total out-of-pocket liability for covered Part B services (excluding prescription drugs -- see Alternative Scenario 5) is limited to \$1530 in 1991.

Persons with AIDS who are likely to have multiple hospitalizations and who will usually have high expenditures for physician services associated with their inpatient and outpatient health care needs will benefit substantially from this change in out-of-pocket liability. The baseline assumption for estimating this distribution of costs between Medicare and the beneficiary was that the beneficiary paid 25 percent of all inpatient hospital costs and 42 percent of all physician services' costs. To estimate the impact of the Catastrophic Act on AIDS-related Medicare costs, the model assumptions have been altered in the following way:

1. Medicare's share of total hospital inpatient costs is assumed to be "Total Hospital Costs" minus (\$540 times the number of Medicare eligible AIDS patients)
2. Medicare's share of total inpatient and outpatient physician services costs is assumed to be "Total Physician Costs" minus (\$1530 times the number of Medicare eligible AIDS patients)

Table 8 presents the change in the distribution of expenses between the Medicare program and beneficiary out-of-pocket liability for inpatient hospital, inpatient physician services, and outpatient physician services, for Medicare eligible persons with AIDS. Medicare's share of inpatient hospital costs increases by 29 percent due to the elimination of the deductible for hospital episodes subsequent to the initial admission annually and to the elimination of cost-sharing after 60 days of consecutive hospitalization. However, Medicare liability for physician services expenditures remains constant in this scenario. The estimated average physician costs incurred by Medicare eligible AIDS patients are \$3,141, an amount that would be associated with only \$688 in beneficiary out-of-pocket costs. Thus, the Part B catastrophic coverage extension would not affect most Medicare beneficiaries with AIDS under the assumptions associated with this scenario. It is probable that, even under these assumptions, some Medicare eligible AIDS patients would exceed the catastrophic cap. However, there is no current information that would permit us to make even a crude estimate of the proportion of beneficiaries that would incur Part B costs high enough to trigger the cap and, therefore, the bottom line impact of the catastrophic cap--a 25 percent increase in Medicare's costs--is attributable solely to the reduction in beneficiary liability for hospital services.

This estimate may well understate the impact of the Catastrophic Coverage Act on Medicare costs for AIDS patients for another reason: this estimate does not take into account the potential demand increase that may be associated with reductions in out-of-pocket costs. Once beneficiaries have paid their initial hospital deductible, all future hospital use is "free" to the beneficiary. Consequently, there may be a tendency to substitute inpatient care for less

TABLE 8

ALTERNATIVE SCENARIO 4:
EFFECT OF CATASTROPHIC COVERAGE ACT OF 1988 ON HOSPITAL AND PHYSICIAN COSTS

	Baseline	Alternative Scenario		Medicare Share	
		Number	Percent Change	Baseline	Percent Change
1. Number of Medicare Eligible AIDS Cases in California, 1991	843	843	0		
2. Annual Service Use Estimates					
Inpatient hospital (days)	14,959	14,959	0		
Inpatient physician (visits)	17,481	17,481	0		
Outpatient physician (visits)	17,734	17,734	0		
3. Aggregate Costs for Medicare- Eligible AIDS Cases					
Inpatient hospital	\$11,967,200	\$11,967,200	0	\$8,939,498	29
Inpatient physician	874,050	874,050	0	505,201	0
Outpatient physician	1,773,400	1,173,400	0	1,025,025	0
Total	14,614,650	14,614,650	0	10,469,724	25
4. Average Cost Per Beneficiary					
Inpatient hospital	\$14,196	14,196	0		
Inpatient physician	1,037	1,037	0		
Outpatient physician	2,104	2,104	0		
Total average cost	17,337	17,337	0		
Medicare cost	12,420	15,471	25		
Beneficiary Liability	4,917	4,917	0		

well-insured outpatient coverage, particularly when beneficiaries ability to pay is in question. Similarly, when the Part B cap is reached, there is no longer any budget constraint facing the patient (assuming their physician or other providers accept assignment). Again, demand may be expected to increase in response to the elimination of cost-sharing after the cap is reached. Since there are no data to permit an estimate of this effect to be made, it is not included in Alternative Scenario 4. This implies that the estimated impact on Medicare costs presented in Table 8 may well understate the longer-run cost effects of the Catastrophic Coverage Act of 1988.

Alternative Scenario 5: Expansion of Medicare to Cover Prescription Drugs. Under the Catastrophic Coverage Act of 1988, 50 percent of prescription drug costs that exceed a cap of \$600 in 1991 will be covered under the Medicare Part B program. The implication of this expansion of benefits for costs to the Medicare program related to AIDS in 1991 in California is shown in Table 9. The assumptions underlying this estimate are:

1. AZT will be prescribed for all symptomatic AIDS patients who are Medicare eligible.
2. Half of Medicare eligible persons with AIDS will not be able to tolerate the side effects of the drug or will die during the year and, therefore, will incur only an average of 6 months costs annually; the remaining AIDS patients will use AZT for the full year.
3. The annual cost of AZT for a patient on the drug for a full year will be \$9600.

Costs to the Medicare program for this expansion of benefits are estimated to increase by 27 percent. This estimate may be relatively low, since it is quite likely that some physicians may prescribe AZT (or similar drugs) to asymptomatic HIV positive Medicare beneficiaries. However, since the majority of Medicare

TABLE 9

ALTERNATIVE SCENARIO 5:
EFFECT OF PRESCRIPTION DRUG BENEFIT UNDER THE CATASTROPHIC COVERAGE ACT OF 1988

	Baseline	Alternative Scenario		Medicare Share	
		Number	Percent Change	Baseline	Percent Change
1. Number of Medicare Eligible AIDS Cases in California, 1991	843	843	0		
2. Annual Service Use Estimates					
Inpatient hospital (days)	14,959	14,959	0		
Inpatient physician (visits)	17,481	17,481	0		
Outpatient physician (visits)	17,734	17,734	0		
Drugs (daily units)	N/A	231,045	N/A		
3. Aggregate Costs for Medicare- Eligible AIDS Cases					
Inpatient hospital	\$11,967,200	\$11,967,200	0	\$8,939,498	0
Inpatient physician	874,050	874,050	0	505,201	0
Outpatient physician	1,773,400	1,773,400	0	1,025,025	0
Drugs	N/A	6,067,200	N/A	N/A	N/A
Total	14,614,650	20,681,850	42	13,250,424	27
4. Average Cost Per Beneficiary					
Inpatient hospital	\$14,196	\$14,196	0		
Inpatient physician	1,037	1,037	0		
Outpatient physician	2,104	2,104	0		
Drugs	N/A	7,197	N/A		
Total average cost	17,337	24,534	42		
Medicare cost	12,420	15,718	27		
Beneficiary Liability	4,917	8,816	79		

eligible AIDS patients are likely to be eligible via the Disability Insurance program, there are probably only a small number of Medicare eligible HIV positive patients who might receive prescription drug therapy as a preventive measure. The patient's out-of-pocket liability will increase 79 percent due to the addition of the prescription drug benefit in 1991. However, it is worth pointing out that 1991 is a transition year for the prescription drug benefit under the Catastrophic Coverage Act and coinsurance, at 50 percent, is much higher than it will be when the benefit is fully in place. Consequently, the 1991 estimate understates Medicare's liability in future years and overstates beneficiary liability. On the other hand, it is likely that Medicare beneficiaries with AIDS will use prescription drugs in addition to AZT and these costs are not included in the estimate due to insufficient information to permit even rough estimates to be made with any confidence. Similarly, the prescription drug benefit under Medicare may be expected to increase demand for drug therapies for patients who anticipate exceeding the \$600 deductible and this increased demand is not considered in Alternative Scenario 5.

Overall, these factors suggest that the prescription drug benefit under the Catastrophic Coverage Act may have a much greater impact on Medicare costs, in the long run, than is evidenced in Table 9.

H. DISCUSSION

Unless there is a significant change in the epidemiological assumptions, treatments, or Medicare eligibility policy, the AIDS epidemic is unlikely to have a serious impact on the financial stability of the Medicare program over the next decade. However, as the alternative scenarios described above have illustrated, changes in assumptions or policy may have a significant effect on

Medicare costs related to AIDS. In particular, a change in the distribution of cases by age, due to epidemiological changes or longer survival time, or to a decrease in the waiting time for Medicare eligibility under the Disability Insurance program, could have a dramatic effect on Medicare costs for AIDS.

These estimates have been made based upon data from California, where case mix and service use appears to be less severe and less intensive than in other areas of the country. Even in California, the maximum change in Medicare expenditures related to changes in the assumptions about AIDS examined in this paper would only increase total Medicare Part A expenditures by 719 percent and Medicare Part B expenditures by 660 percent, if the DI Medicare eligibility waiting period was reduced to 12 months. In 1988, this would result in an increase in Medicare Part A expenditures for AIDS patients from approximately \$12.8 million to \$105 million. The comparable increase in Medicare Part B expenses would result in spending of \$16.7 million. Total Medicare spending in 1988 would be \$121.7 million--still only .0014 percent of the total 1988 Medicare budget. This is, however, a seven-fold increase and, depending upon the epidemiology of AIDS, the still uncertain number and age distribution of the AIDS' infected but asymptomatic population, and new therapeutic developments, the cost of AIDS to the Medicare program could be higher by 1991 than this increase suggests. A combination of changes in assumptions -- e.g. elimination of the DI waiting period for Medicare eligibility, new life prolonging but not curative therapies, and changing epidemiology, for example--could result in a significantly higher cost to Medicare. However, there is probably little likelihood that this most severe combination of events will occur and AIDS will continue to be a serious problem for the nation, but have only a minor impact on the Medicare program. In addition, it is possible that the premature deaths

of persons with AIDS will result in a reduction in Medicare costs since these individuals will not reach the age of Medicare eligibility. The cost estimation methodology that is used for this study does not have the capability to offset the costs incurred for AIDS by costs avoided due to premature deaths. Similarly, it is uncertain whether the course of the disease and associated costs, in present or in the future, will generate costs to the Medicare program that are greater than would be incurred by any Medicare beneficiary in the last year of life. If the costs of AIDS and the costs of the last year of life involving other diagnoses are similar, then the impact of AIDS on the Medicare program may be primarily one of timing, rather than total outlays.

There is still much to learn about the costs of AIDS and how these costs will be distributed across payers in the future, under current assumptions and under alternative assumptions. The estimates that have been presented in this paper are based on extremely limited data. Reliable estimates of the potential economic implications of AIDS for the Medicare program will require that considerable additional data and experience be accumulated. Table 10 summarizes the information that would be helpful to permit further examination of this issue; however, the estimates and discussion presented in this paper strongly suggest that AIDS is not an immediate issue of significant importance to financing of the Medicare program.

TABLE 10

ISSUES FOR THE EXAMINATION OF THE POTENTIAL IMPACT OF AIDS
ON THE MEDICARE PROGRAM:
BASELINE ESTIMATES AND PROJECTIONS

Issue	Questions
<u>Epidemiology</u>	<ul style="list-style-type: none"> • How many persons currently have AIDS and are Medicare eligible? <ul style="list-style-type: none"> -- aged -- disabled • What is the current distribution of Medicare eligible AIDS patients by risk group? <ul style="list-style-type: none"> -- gay/bisexual -- blood products -- IV drug users -- heterosexual -- other • What is the current distribution of Medicare-eligible AIDS patients by principal manifestation? <ul style="list-style-type: none"> -- PCP -- KS -- other • What is the current geographic distribution of Medicare eligible AIDS patients? • What is the average longevity of Medicare-eligible AIDS patients, after diagnosis, by risk category, by principal manifestation, and by Medicare eligibility category? • What is the age distribution of aged Medicare-eligible AIDS patients? • What do currently known epidemiological factors suggest about the proportion of AIDS patients that will be Medicare eligible in 1991 and 1996?
<u>Eligibility</u>	<ul style="list-style-type: none"> • Under current eligibility rules, how many Medicare-eligible AIDS patients will there be in 1991 and 1996? <ul style="list-style-type: none"> -- aged -- disabled
<u>Services Coverage</u>	<ul style="list-style-type: none"> • What proportion of services used by Medicare-eligible AIDS patients are Medicare covered services?

- How does service mix and service intensity differ for Medicare eligible AIDS patients compared to all AIDS patients? For aged versus DI eligible Medicare beneficiaries?
- Does the acute care emphasis of the insurance coverage provided by the Medicare program affect the mix of services used -- particularly for those Medicare beneficiaries who are not Medicaid eligible and, thus, have limited long term care benefits available?
- To what extent will the mix of services be influenced by the increased depth of insurance coverage available under the Catastrophic Coverage Act of 1988? The volume of services?
- What effect will prescription drug coverage under the Catastrophic Coverage Act of 1988 have on the prescribing behavior of physicians treating Medicare eligible AIDS patients?

Alternative Payment Sources

- What proportion of Medicare-eligible AIDS patients are covered under other public or private insurance?
 - Medicaid
 - VA
 - Medicare supplemental insurance
 - Other private insurance
- Are there differences among Medicare-eligible AIDS patients in risk category, eligibility category, and/or principal manifestation, by alternative sources of payment?

Costs

- Are lifetime, annual, and last-year-of-life treatment costs for Medicare-eligible AIDS patients comparable to treatment costs for non-eligible AIDS patients?
 - by risk group
 - by eligibility category
 - by principal manifestation
- Do lifetime, annual, and last-year-of-life treatment costs vary by age?
- How many months of Medicare eligibility are expected for AIDS patients?
 - by risk group
 - by eligibility category
 - by principal manifestation?

- Do lifetime, annual, and last-year-of-life treatment costs vary for Medicare-eligible AIDS patients by alternative financing sources available?
- For aged Medicare beneficiaries, do lifetime, annual, and last-year-of-life costs differ for those with and those without AIDS?
- If AIDS patients die at earlier ages than non-AIDS Infected Medicare beneficiaries, what lifetime costs under Medicare will be avoided?
- How are expected costs to Medicare distributed between Medicare Part A and Part B under current arrangements?
- Under current assumptions, how will costs in 1991 and 1996 be distributed between Part A and Part B?

Financing Innovations

- Are there current trends in paying for services under Medicare that will result in higher or lower costs for Medicare-eligible AIDS patients by 1991 and 1996?
- Are there current trends or changes in financing of Medicare Part A and Part B that imply higher or lower expenditures for Medicare eligible AIDS patients in 1991 and 1996?

Service Delivery Innovations

- Are there current Medicare service delivery trends that suggest future services mix and costs will be different for AIDS patients under Medicare (e.g., managed care, hospice)?

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